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NORMAN CARTER FASSETT 1900-1954

DONALD CULROSS PEATTIE

IN each generation there are certain people (just a few in a million), who are born botanists. One such was Norman Carter Fassett, whose death on September 14, 1954, at Boothbay Harbor, Maine, is a loss to his science as to his friends. A member of the New England Botanical Club since 1920, he was at the time of his death President of the American Society of Plant Taxonomists, and a full professor of botany in the University of Wisconsin. But these and many other professional connections, activities, and achievements, do not begin to suggest the depth of his feeling for his science. It is not too much too say that the great love of his life was the flora of his native land.

To be a born botanist, as Fassett was, is not the same thing as being a born gardener. The most ardent gardeners I have known are preoccupied with making plants grow where, and as, they do not seem naturally inclined to grow; your real gardener wants to bring every plant that appears in his eyes worthy of the honor into cultivation, and to improve upon it. I could never discover that my friend Fassett had the gardener's gift. He loved plants as he found them, and where he found them, and looked with some distaste upon plants out of place. The planting of thousands of Colorado blue spruce on Mt. Washington, New Hampshire, was proudly announced at a meeting of the New England Botanical Club in 1921, and I distinctly recollect how this left my friend not cold but hot under the collar.

Nor was he one of the type that I shall venture to call the "made" botanist. By that I mean one who at some time in his college training or even later decides to turn upon plants an

intellect that would have been equally happy, perhaps, in physics, chemistry or even mathematics. This group includes, I know, some of the greatest names in botany today. And it is with no intention to belittle their achievements that I say that to those of this persuasion whom I have known, a living plant, *in situ*, may mean comparatively little. It must be brought into the laboratory and "controlled" before it yields up any intellectual satisfactions for the "made" botanist. It is hard to believe that plants could ever have for such botanists any emotional content.

A sentence from a letter which he wrote me in 1921 will show how different was Fassett's approach, even in these early days. "I have fallen in love this summer," he wrote in 1921, "with the three *Osmundas*." I can imagine a similar sentence (indeed there is one) dropping from the pen of the young Linnaeus, the young Theophrastus, the young Haller (poet-botanist of the flora of the Alps), William Hooker or Konrad Sprengel—all of them born botanists. I cannot conceive that a Nägeli, an Ingen-Housz, a Correns, a von Mohl, or a Weissmann, would ever have fallen in love with a genus of ferns, or if such a weakness had overcome them in early youth, it would never have been admitted in writing!

Norman Carter Fassett was born March 27, 1900 in Ware, Massachusetts. When I first knew him, however, he was living with his delightful family in Leominster, and together we used to tramp the autumn woods thereabouts and the frozen bogs in winter, and fish from the same stream in May. But Norman's real love was for Maine, where his mother had been born and where the Fassett family had a summer home, at Ocean Point. When I visited him there he showed me, as one reveals a holy object, a spot particularly beloved by him—a tunnel-like, moss-grown path through a grove of spruce all hung with *Usnea* lichen. He felt too deeply about it to speak; he simply stood aside and revealed it to me, with his light blue eyes shining. We looked at each other as two who share a common Faith, and nodded in unspoken understanding.

We first met, as mates of the class of '22 at Harvard, on the opening day of Fernald's famous Botany 7 course, in the autumn of 1919. It was always a very small class; probably few ever took it except those who had already heard of it, and knew it was

unlike any other botanical course elsewhere offered. Yet all the others in that particular class have faded from my memory. Only Norman remains clear to me. One might say I remember him because none of the rest of us was destined to go so far in this branch of botany as he. But he had a quiet yet intense enthusiasm, a shy but strong personality that no one could forget.

Fassett as a nineteen-year-old was indeed a shy person—but shy not from a fear that you would not notice him, but from genuine modesty. He told me that (so he fancied) he always made a poor first impression. All that amounted to was that he was decidedly not a born actor. He did not project his personality; his pawky humor and his steady loyalty to friends gradually dawned on you. And it might take you some time to realize how well he knew what he knew. Rather slight in frame, he even entered a room more unobtrusively than anyone of force and importance I have ever known.

In our last two years at Harvard we were roommates and went constantly about together. In this period I came to understand how much he owed to the New England or Thoreauvian tradition. I don't mean that he had ever, at that time, read a word of the Sage of Walden, still less that he was a Transcendentalist or moralist. Rather do I mean that the same attitude taught both men to love New England bogs just because they are so acid, and the family of the sedges because they are, botanically, so tough. Each liked a wrestle with Nature—liked to show that he could start a fire with wet wood and "preferred snow on his wildflowers," as Norman put it to me when I was trying to extol the beauties of a Carolina spring.

Norman had also—at this time but not in later years—the limitations of a sweetly provincial training. His knowledge of fiction seemed to stop with Dickens, and of poetry, with Longfellow. (I introduced him literally to Vachel Lindsay and literarily to Omar.) The higher music he left to his brother Jimmy—now James Fassett the distinguished radio music commentator for the New York Philharmonic Orchestra. But Norman had a fund of comic songs which I have never heard from anyone else, and "Pinafore" was his favorite (and only) opera.

Languages were a devilment to my friend, not I think because

of inability but because there seemed to him no good reason for learning to say something as foreigners say it when he could say it perfectly well in English. (I dragged him through his second try at first-year German—a case of the blind leading the blind.)

It was with difficulty that I persuaded him to climb Mt. Washington with me. Mountains, in his philosophy at the time, were rather excessive phenomena not to be given overt approval by one to whom the coast of Maine was the last word in God's good creation. In vain I tried to get him to botanize the southern Appalachians with me. And Fassett had then the perfectly formed conception of the Middle West commonly and firmly held by people who have never been there. Wisconsin—where he was to spend so much of his life and do so much fine work—was, I distinctly recollect, the prime object of his half-humorous scorn. That I had been there and he hadn't merely proved the folly and delusion of travel. (One must reread Thoreau's remarks on the futility of Emerson's trip to Europe, and the superiority of Concord woods over the California redwoods, to understand that my friend was not being a young eccentric but was actually conforming to the conventions of his environment.)

After Botany 7 had come to an end, Fernald urged his students to collect during the summer and he generally referred them to some special problem of interest to him which could best be solved by collecting in the student's "home region." He sent me off, for instance, to my native haunts—the head of Lake Michigan, to look for the coastal plain element in the flora of the Great Lakes, and dispatched Fassett to his beloved Maine, to collect the estuary plants.

This was a promising subject—the aquatic flora of a region that is part brackish, part fresh, and may be expected to give shelter to long littoral extensions of ranges. But collecting plants on mud flats is not light or delightful work. It is extremely toilsome, sticky, mucky, hot (or cold), and smelly. It was a long wearisome summer that the young man put in, as his letters to me revealed, and he was often lonely. For this was not the Maine coast of surf and rocks, of the odor of spruce and the taste of lobster, that he loved. His brother James dropped in to see Norman and looked out in horror over the muddy waste which Norman was preparing at that moment to cross. "Are you going

out there?" Jimmy demanded, aghast. "Have to," Norman answered. "You're crazy!" cried Jimmy wildly. Still, not lacking in courage, James followed his brother out on the queazy mass, half liquid, half solid, and helped him collect plants. I believe James never went out a second time, but Norman fought it out along these lines—like General Grant. And it did take all summer.

Estuarine plants do not make a showy collection in an herbarium. It seemed to me, as I reviewed the results of his summer toil, that they were all minute apetalous flowers (or capsules) sessile in the axils of opposite leaves—and I said so. He agreed; he found their identification a tedious business, over which he was busied for a year. But he faced the fact that in science there is a great deal of tedium. Plugging steadily ahead, in following summers he extended his estuarine studies to the Gulf of St. Lawrence and the Maritime Provinces of Canada.

In our last undergraduate year, Fassett and I roomed together in Stoughton Hall and were graduated together, he with the degree of B.S., class of 1922. While I went off to a job in the Office of Foreign Seed and Plant Introduction in the Department of Agriculture in Washington, Fassett continued on at Harvard, teaching there and at Radcliffe from 1922 to 1924 and earning the degree of M.A. in 1923, while in 1925 he went through the ordeal (described to me by its victim in all its horrid details) of a successful Ph.D. degree. His thesis was published, after the usual delays so agonizing to young authors, in 1928 by the Boston Society of Natural History, *Proceedings* vol. 39, pages 73–130, and bore the title of "The Vegetation of the Estuaries of Northeastern North America." Such titles do not set the Seine, far less the Charles and the Mystic, on fire. Yet in the slow course of professorial time, this paper *was* noticed, and with increasing respect, so that he was called upon to make surveys of the aquatic vegetation first of Wisconsin and in later years of Central America, until he became perhaps the country's leading authority on the subject.

In the meantime he had been appointed, in 1925, to an instructorship in botany at the University of Wisconsin. Madison, he reported, was to his (feigned) astonishment quite a delightful place, "almost a New England town." Chicago, where I showed

him around for the first time, amazed him. With a twinkle in his blue eyes he remarked that "the place is undoubtedly growing." The Wisconsin North Woods, he wrote, had the "right kind of trees,"—spruces, birches, white and red pines. His first classes did not interest him, he wrote me. After all, who cares to go over the same old ground of elementary plant physiology, and photosynthesis, and the conjugation of *Spirogyra*?

His rise at Wisconsin was rapid, however; he was Assistant Professor by 1929, Associate Professor in 1937, and full Professor and Curator of the Herbarium in 1944. "Under his guidance," say his colleagues, in *Memorial Resolutions . . . , on the Death of Professor Norman Carter Fassett*, "the Herbarium of the University has grown from a collection of 96,000 specimens, including 15,000 specimens of Wisconsin plants, to the impressive and exceedingly valuable collection of 380,000 specimens, including 68,000 specimens in the Wisconsin collection. The specimens personally collected by him number 28,000."

It is only fitting that his colleagues at Wisconsin should speak for him and his nearly 30 years of brilliant work at Madison, and so I shall take the liberty of quoting further from their admirable testimonial. "Dr. Fassett's profound enthusiasm for the out-of-doors and his sensitive dismay at the changes being wrought by man led him to become one of the leaders of conservation thought in Wisconsin. Although not a writer in the field, his lectures and his conversations with his students and colleagues imbued many with the spirit of conservation. Through his influence an undergraduate major in the biological aspects of conservation was started at the University and the state board for the preservation of scientific areas was brought into being. He was active in the establishment and development of the University Arboretum. His wide influence upon the students from so many diverse fields impressed many of the citizens of Wisconsin with the importance of an ecological conscience. No student ever left his classes without an increased perception of America's magnificent natural resources, the sweep of their evolution in the past, their significance and beauty in the present, and our own responsibility for their full enjoyment by the generations that are to follow us. These attitudes and ideas spread into many departments of the University and far beyond it. . . .

"A forceful and stimulating personality, Dr. Fassett was noted for the excellence of his lectures. His classes were sought by students in many fields of science. Colleagues teaching in other departments paid him a rare tribute in asking him to give the opening lecture in one course and the final one in another. Sparkling wit, dry humor and a wealth of illustrative material characterized his delivery. No man ever did more to bring the salty air of the New England coast to a Midwestern campus. Abundant photographs taken on his many travels were used to illustrate points he wished to make. Always a firm believer in the necessity of field work in botany, Dr. Fassett led his classes on many memorable trips. Who among his students can forget their professor 'swinging on the birches' of the north slopes along the Wisconsin River valley, or his savory stews garnished with the local vegetation, along with many an important botanical precept."

Four excellent books bear Fassett's name. First there is his very concise and handy *Spring Flora of Wisconsin* (1931 reprinted in 1938), his *Leguminous Plants of Wisconsin* (1939) with its very carefully mapped ranges and excellent keys and lucid full descriptions and photographs far above the average of botanists' attempts (they are usually pretty amateurish) at photography. Then in 1940 McGraw Hill published his *magnum opus*, *A Manual of Aquatic Plants*. With hundreds of excellent diagnostic drawing and 382 pages of text, it was made further useful by very full notes on the uses of aquatic vegetation by wildlife. His last work was *Grasses of Wisconsin* (1951), a model of clarity and conciseness, excellently illustrated and with many distributional maps.

During World War II Fassett was called upon, with other botanists, to make a search upon behalf of our armed forces fighting in malarial regions, to locate in its native countries new sources of *Cinchona*, the tree that yields quinine. The Japanese having seized the Dutch East Indies, the regular supply of quinine was cut off, and the suffering of our troops at Corregidor, from lack of quinine, are too well known to repeat. Fassett tells the story (omitting only his first agonies over the Spanish language) in the *25th Anniversary Report of Harvard Class of 1922*, and he tells it so well that I can only quote his own modest and humorous account of it as he gave it there:

"For me, the war's interruption of normal routine took the form of a year's sojourn in Colombia, South America, where I explored the Andes for *Cinchona*, the tree whose bark yields quinine. The life we led in the Cinchona Mission was well described in a recent issue of the *National Geographic* on the Cinchona mission in Ecuador (which failed to state that more *Cinchona* bark was shipped from Colombia than from all the rest of South America combined).

"The story is this: *Cinchona* is found in the wild state only in the high mountain areas of South America, but for nearly a century the commercial supply has come from plantations (originally from South American seed) in Java and the Philippines. At just the time when need for quinine became most acute these sources became unavailable, so we had to go back to South America to tap the wild supply. But the trees in their native regions are unreliable. In one region they may have a high quinine content and in others be quite useless. So botanists were called for exploration, to locate the stands of trees and bring back samples for chemical analysis. There were about ten of us in Colombia. Each travelled with a Colombian boy for an assistant. We drove, over wild mountain roads overhanging eternity, to villages as remote as could be reached by automobile. The assistant hired guides and mules, and we climbed, usually to eight or nine thousand feet. When the going got too tough for the mules, we continued on foot, cutting trail with machetes and often climbing almost vertically for half a day. Most of the time it rained. After locating a stand of *Cinchona*, we would cut a few trees and strip the bark and make herbarium specimens. If examination of the latter showed it to be the right species and analysis of the bark showed it to have satisfactory alkaloid content, word would be sent back that we would buy bark from that particular region. And that, my friends who were in the tropics, is how you got your quinine—unless you used atabrine!"

Fassett's ever-growing reputation as a specialist on aquatic vegetation caused him to be called more than once to Central America to study the water plants of the tropics. On some of these trips he was accompanied by his adolescent son Charles who, to his great pride, has since followed in his botanical footsteps and is now on the botanical faculty of the University of

Wisconsin. It was in December of 1953, I believe, that he was suddenly stricken down, in Managua, Nicaragua, with a blow to his health. "Until that day," he wrote me in February, "I was just as active as the day we climbed Mt. Washington together." He was hospitalized there for some weeks before being returned to Madison, and there he was told that the lesion in the brain was a very mild one and would soon mend. But on February 21 he had another hemorrhage and the next day was hospitalized, almost dead. And here is the fine, fighting, sporting spirit in which he wrote me on July 18:

"The doctor said I might recover and walk again—you know how a poor old guy stumps along after a stroke. I now walk as well as ever, and yesterday I was climbing trees with a friend's children. On March 11 a tumor was removed just above the right ear. Five days later I staggered to my feet, grabbed a likely looking nurse, and polka'd down the corridor. Forgive my smarty boasting—I have to get what fun I can out of this. Since then I have been in and out of the hospital much of the time delirious or just plain unconscious. For a couple of weeks now I have been out of the hospital, and hard at work. The cancer is coming back, and I am given a few months to live. I am working hard to finish a number of jobs. Just completed a monograph of *Echinodorus*. Now am starting a report on my recent trip to Central America. I have a lot of papers under way, and want to leave them so somebody can pick them up. I fear I shall not get to the Spring Flora of New England. It is finished up into the Cruciferae. Think I shall send you a copy of the Monocots. Wish I could find somebody to finish it. What I plan (or hope) to do is get various persons to take on some of these papers, then leave the manuscript (if I have to leave it) with directions to have it sent to that person. Most of the monographs of Central American aquatics were written at the Gray Herbarium when I was there four years ago, and are just about in the state where Fernald published. That is: one must borrow material from the larger herbaria, work it up and make necessary changes, plot maps, cite specimens, etc. If you think of any likely candidates, let me know. Or, would make some nice theses, under proper direction.

"My eyesight is still very bad, with the left upper quarter of

the field of vision gone. Everything looks funny, and I feel as if a flash bulb had just gone off before my eyes. My hands tingle continuously. I get confused very easily. I am living with Marcia*, who is now married, on the edge of town, but still keep my apartment near the University. Ever since you introduced me to Omar, on the banks of the Charles, I have lived by his philosophy, and it has paid off. Now I eat well, sleep well, and enjoy my likker. Wonder how it will strike me at the end—will there be a general decay of faculties as the cancer progresses, or will I have a grand hemorrhage that really slaps me down?

"O. K. It's been fun."

My old friend spent a few very happy last weeks at Boothbay Harbor. Then he was taken to the hospital, unconscious, and lingered, without pain I believe and hope, until the fourteenth of September. He was much too young to go. Years of fruitful research and teaching, and many books, should still have come from his great gifts. His loss is a loss to science. As to his personal friends, they feel it too keenly to be able to speak of it.

CONTRIBUTIONS TO THE FLORA OF NOVA SCOTIA IV

E. C. SMITH AND J. S. ERSKINE

DURING the past few years rather extensive floristic surveys have been carried out in Nova Scotia sponsored mainly by the Nova Scotia Museum of Science and by the Nova Scotia Research Foundation. The former has been directed toward ecological studies of particular areas of the province and the building up of the herbarium of the sponsoring institution under the direction of J. S. Erskine. The latter survey has been conducted by E. C. Smith in connection with forest ecology studies. Some of the results of these surveys have already been published (Erskine, D. S. 1951; Erskine, J. S. 1953 and 1954; Smith and Schofield 1952; Schofield and Smith 1953). In the above and in the present paper, records of new plants for the province of particular interest have been the arctic-montane species reported mainly from northern Cape Breton Island which fill in range gaps from Newfoundland, New Brunswick, and New England.

* His daughter.

New plants of southern affinities have also been found and the coastal plain species of the province have been shown to be more widely dispersed than was previously supposed. The more intensive coverage of the province has also shown that some of our supposedly local and rare plants are more widely dispersed than was formerly thought. A considerable number of the records of species new to the province are naturalized introductions, and it is doubtful whether some of these will persist.

Many of the arctic-montane species have so far been found to be of very local distribution with each of the river valleys of northern Inverness and Victoria Counties having one or two species peculiar to one valley; i.e. *Oxyria digyna* (L.) Hill and *Saxifraga aizoides* L. from Big Southwest Brook, and *Phyllodoce caerulea* (L.) Babingt. and *Diapensia lapponica* L. from Lockhart Brook. The latter two species were confined to one series of north facing cliffs. Not all of these northern plants are restricted to northern Cape Breton. As the systematic exploration of the Cobequid Mountains of Cumberland and Colchester Counties, and the North Mountain, Kings County proceeds, more of these plants are being found, i. e. *Poa glaucantha* Gaudin and *Trisetum spicatum* (L.) Richter, var. *pilosiglume* Fern. at Amethyst Cove, Kings County, and *Solidago macrophylla* Pursh from this area and also from Cumberland and Colchester Counties.

The annotated list below of new and rare plants for the province is mainly the results of the 1952 summer exploration of the two groups mentioned above. During part of this time the two parties co-operated in the study of some areas in northern Cape Breton.

Grateful acknowledgement is made to the Nova Scotia Research Foundation and to the Nova Scotia Museum of Science for financial support and to the following persons who have aided the authors in various ways; D. S. Erskine for aid in identification and for bringing numerous interesting records to the attention of the authors; to W. G. Dore and staff of the Central Experimental Farm, Ottawa for determination of the *Gramineae* and other groups; to A. E. Porsild and H. J. Scoggan of the National Herbarium for checking the identity of some difficult species; and to A. E. Roland, Provincial Botanist, and others for permission to publish various records.

Various abbreviations are used throughout the paper. 1. JSE preceding a collection number refers to J. S. Erskine as collector. 2. The collections of the forest ecology parties are designated as follows: SECS: E. C. Smith, D. S. Erskine, E. H. Collins, W. B. Schofield in 1948; SCBS: E. C. Smith, E. H. Collins, J. M. Bruce, D. R. Sampson in 1949; SCBSB: E. C. Smith, E. H. Collins, J. M. Bruce, D. R. Sampson, F. C. Bent in 1950; SSSB: E. C. Smith, W. B. Schofield, D. R. Sampson, F. C. Bent in 1951; STWS: E. C. Smith, J. C. Taylor, D. H. Webster, L. B. Slipp in 1952 and 1953; SSTWS: E. C. Smith, W. B. Schofield, J. C. Taylor, D. H. Webster, L. B. Slipp in July 1953. 3. Can: National Herbarium, Ottawa; DAO: Department of Agriculture, Ottawa. 4. NSAC: Nova Scotia Agriculture College, Truro, N. S.

LYCOPODIUM SELAGO L. Reported first for the mainland of Nova Scotia by J. S. Erskine (1953), this plant is also known from Digby County: bank of run, Seal Cove, Brier Island, Roland, Smith *et al.*, June 15, 1949; occasional to rare on moss hummocks bordering small runnel through bog near Seal Cove, Brier Island, W. B. Schofield, September 4, 1951.

SELAGINELLA SELAGINOIDES (L.) Link. Known to be of scattered occurrence in the bogs of northern Cape Breton, the following two collections show the presence of this plant on the mainland and on southern Cape Breton. Richmond County: rare in bog, West L'Ardoise, SSSB 5137; Digby County: common in bog, center of Brier Island, Roland, Smith *et al.* 90.

WOODSIA GLABELLA R. Br. To the three known stations, all from Inverness County, for this rare fern (Robinson, 1904; Smith and Schofield, 1952) the following may be added: Victoria County: very rare on damp north-facing cliff wall, Indian Brook, STWS 6606; very rare in crevices of dry cliff, Lockhart Brook, Salmon River, SSTWS 7895.

CRYPTOGRAMMA STELLERI (Gmel.) Prantl. Inverness County: abundant on shaded limestone cliff, Hillsborough, STWS 6684; abundant in shaded crevices of conglomerate cliff face near Whycocomagh, SSTWS 8672. A northern or alpine species, known from Newfoundland, New Brunswick, and New England, these collections are the first for the province.

SPARGANIUM MULTIPEDUNCULATUM (Morong) Rydb. Reported by Roland (1947) as present at Sydney, North Sydney and Sable Island, the following two stations are of interest. Inverness County: in water of pond, Presquile, SCBSB 3380; Digby County: pond, Sandy Cove, JSE 52.1261.

SPARGANIUM FLUCTUANS (Morong) Rob. Rarely collected in the province, the following collections show a wider distribution than was formerly supposed. Cape Breton County: in water of pond back of beach, Main-a-Dieu, SCBS 2849, the first collection for Cape Breton Island; Guysborough County: leaves floating in water of Mannassette Lake, STWS 6793; in water of lake, three miles south of Goldenville, SECS 575; Halifax County: Chain Lakes, St. Margaret's Bay Road near Halifax, E. Gorham 45.1383; Cumberland County: in shallows of Big

Lake, JSE 52.978; Annapolis County: floating in two feet of water, McEwan's Lake, Albany, J. S. and D. S. Erskine: 262.

SPARGANIUM MINIMUM (Hartm.) Fries. Collected but once before on the mainland (Fernald, 1921), this plant was found growing in a lagoon of the Gaspereau River near Gaspereau, Kings County: D. H. Webster, September 3, 1952. To the known stations on Cape Breton Island may be added those from water of a lagoon of the Southeast Mabou River, Hillsborough, Inverness County, STWS 6704; and from a pond, Main-a-Dieu, Cape Breton County, JSE 51.1325.

POA ALSODES Gray. This rare grass was collected previously from four stations, two each from Colchester and Inverness Counties. Victoria County: in meadow at river edge, Cape North Village, STWS 6421.

POA GLAUCANTHA Gaudin. The report of *P. glauca* Vahl from the Province (Smith and Schofield, 1952), and at that time considered by Dore (*in litt.*) to be not quite typical, is now placed by him in *P. glaucantha* as are the following collections. Victoria County: cliff crevices, Gray Glen, JSE 52.358; occasional on dry cliff, one mile from mouth of Indian Brook, STWS 6629; Kings County: cliff crevices, Amethyst Cove, JSE 52.580. The latter collection is the first from the mainland of the province.

ERAGROSTIS CILIANENSIS (All.) Lutati (= *E. megastachya* (Koeler) Link). Kings County: edge of beach, Hall's Harbour, J. S. Erskine, August 12, 1949 (NSAC). Reported once previously as an adventive in the vicinity of Halifax in 1938 by Dore and Roland (1942), this station was also adventive.

LOLIUM MULTIFLORUM Lam. Kings County: old lawn, Wolfville, G. C. Warren, September 21, 1950; Hants County: in old field where it must have persisted for many years, Windsor, JSE 52.1143. Previously reported by D. S. Erskine (1951) from Halifax County, these records were confirmed by Dore who also knew of other stations not reported in his work (Dore and Roland, 1942).

ELYMUS CANADENSIS L. Pictou County: beside river at Alma, JSE 53.430. This collection confirms Macoun's report of this species from Pictou County. Cape Breton County: Sydney, G. C. Warren, July 5, 1938.

ARRHENATHERUM ELATIUS (L.) Mert. & Koch. Cape Breton County: Sydney, G. C. Warren, July 5, 1938 and July 15, 1948. These are the first collections for Cape Breton Island. Lunenburg County: gravelly roadside, East River, SECS 352; Kings County: Lake George, G. C. Warren, July 18, 1951; Digby County: roadside at North Light, Brier Island, Roland, Smith *et al.* 514. This grass was previously known from a well established station in Yarmouth County (Dore and Roland, 1942).

TRisetum SPICATUM (L.) Richter, var. *PILOSIGLUME* Fern. Kings County: in cliff crevices and on ledges, Amethyst Cove, JSE 52.576; W. B. Schofield and D. H. Webster 4647. The Amethyst Cove station for this grass is the first for the mainland of Nova Scotia although it has been found to be present in many cliff habitats in northern Cape Breton.

MUHLenbergia MEXICANA (L.) Trin. Halifax County: Grand Lake,

M. O. Malte, September 5, 1924 (Can.). Known also from the Gaspereau, Halfway and St. Croix Rivers of the Minas Basin drainage in Kings and Hants Counties as reported by Dore and Roland (1942) and shown by the following collections, all from Kings County: crevices in rock cliff, Curry Brook, Wallbrook, D. S. Erskine, September 11, 1945; moist gravelly river bank, White Rock, J. S. and D. S. Erskine, September 7, 1945; dryish soil along the Gaspereau River, above Gaspereau, D. S. Erskine, August 12, 1946.

PANICUM VIRGATUM L., var. *SPISSUM* Linder. This grass is native to the southwestern part of the province only, where it occurs at scattered stations. The following collections represent new county records and extensions of range into the central counties. Queens County: edge of north arm of Ponthook Lake, JSE 51.1501; Kings County: Lake George, G. C. Warren, July 18, 1951. The typical variety, apparently introduced, has been collected in Halifax County; railway yard under grain carrier, Halifax, L. S. Brown, September 27, 1949 (NSAC).

PANICUM XANTHOPHYSUM Gray. Lunenburg County: open thickets, Bridgewater, J. Macoun, July 18, 1910 (Can. 81489). Record omitted by Dore and Roland (1942). An extension of range from Maine.

SCIRPUS CESPITOSUS L., var. *DELICATULUS* Fern. Inverness County: abundant in damp cliff crevices, McCoy's Pool, Northeast Margaree River, STWS 6312; a second collection for the province.

CAREX BROMOIDES Schkuhr. Previously collected from a marsh near Truro by Macoun, the following collection, identified by J. A. Calder, represents the second for the province and the first for Cape Breton Island. Inverness County: in large clumps, damp woods, Stratlorne, STWS 6175.

CAREX SCIRPOIDEA Michx. Victoria County: locally abundant in damp cliff crevices and on ledges, Lockhart Brook, Salmon River, STWS 6385. A second collection for the province, it having been collected near Glace Bay by Macoun.

CAREX ABDITA Bickn. Digby County: wet run in old field, south of North Point, Brier Island, Roland, Smith *et al.* 305. This Brier Island occurrence is in keeping with the more northerly range of this species relative to *C. umbellata*.

CAREX TUCKERMANII Boott. Hants County: small swale by woods road northeast of Sweets Corner, J. S. and D. S. Erskine 50.384. New to the province, the collection represents a range extension from New Brunswick.

JUNCUS TRIFIDUS L. Inverness County: one clump on rock face overhanging river, upper Northeast Margaree River, JSE 52.359; Victoria County: occasional in dry crevices of north facing cliff, Lockhart Brook, Salmon River, STWS 6342; dry cliff crevices, Gray Glen near Cape North Village, JSE 52.359. These collections are the first for the province for this arctic-montane species and represent an extension of range from the mountains of Quebec, Newfoundland and New England.

CYPRIPEDIUM REGINAE Walt. This species is one of the rarest of the

genus in Nova Scotia with few recorded stations. The following collections are therefore of interest. Victoria County: rare in swamp, Bay St. Lawrence, JSE 52.392; occasional in alkaline bog near Baddeck Forks, SSTWS 8194; Inverness County: occasional in alkaline bog, Black River, SSSB 4925; Cape Breton County: very abundant in large clumps, swamp, Ball's Creek, SCBSB 3295.

HABENARIA VIRIDIS (L.) R. Br., var. *BRACTEATA* (Muhl.) Gray. Few recent collections of this rare orchid have been made. Rarely abundant, it has been found at scattered stations in northern Cape Breton. Victoria County: abundant in deciduous forest, Lockhart Brook, Salmon River, STWS 6360; occasional in rich intervale forest, North Aspy River, SECS 1131; Inverness County: occasional in fir forest, Cape St. Lawrence, SCBSB 3542.

SALIX CANDIDA Flügge. Inverness County: black spruce bog in alkaline area, Black River, SCBSB 4926 and STWS 7708. A first collection for Nova Scotia and a range extension from Newfoundland and New Brunswick where it is found in calcareous bogs and thickets.

BETULA MICHAUXII Spach. This species was reported from two stations in the province by Rousseau and Raymond (1950), one each from Digby and Guysborough Counties. The former record is based upon the following collections. Digby County: locally abundant in wet parts of peat bog, Big Meadow, Brier Island, Roland, Smith, *et al.* 312 and 539. A third station for this rare species has since been found. Guysborough County: a single colony in grassy sphagnous bog, near mouth of Gaspereau Brook, STWS 9470.

COMANDRA RICHARDSIANA Fern. Previously reported from two stations on the east coast of Cape Breton, the following collections show this plant to be more widespread in this area than was formerly thought. Victoria County: a few large clumps under spruce on sand dunes, South Pond, Aspy Bay, STWS 6461 and JSE 52.376; locally abundant at edge of pond behind beach, one mile south of Black Brook mouth, STWS 6560.

RUMEX MEXICANUS Meisn. Kings County: abundant on river bank below bridge, Kentville, JSE 52.1314. This species was collected once previously by J. S. Erskine at Sweets Corner, Hants County but the specimen was lost. These records are the first for the province and form an extension of range from Chatham, New Brunswick where the species was collected by Groh in 1926.

CHENOPODIUM CAPITATUM (L.) Aschers. Yarmouth County: in garden at Yarmouth, September 19, 1951, collector unknown, leg. I. V. Hall (DAO). New to the province and an extension of range from the Bay of Chaleur, New Brunswick.

MONTIA LAMPROSPERMA Cham. Digby County: rather rare in wet crevices of sea cliff between North Point and Seal Cove, Brier Island, Roland, Smith *et al.* 276; Inverness County: one plant floating in a hillside trickle, Port Hawkesbury, JSE 52.164. Previously collected at Northwest Arm, Halifax by Macoun and Burgess, these recent collections represent

a second and third station for the province and a first for Cape Breton.

THALICTRUM CONFINE Fern. Halifax County: a collection made by M. O. Malte at Grand Lake, September 5, 1924 (Can.) appears to be the first record of this species for the province.

CALTHA PALUSTRIS L. This plant apparently has a sharply restricted range in Nova Scotia being found in marshy places along the coastal plain of northern Inverness County. The collection of Macoun from Whycocomagh in 1883 and the record in Lindsay's list (1877) from Mahone Bay have not been substantiated by collections in recent years although several attempts have been made to relocate it. The following collections indicate the present known range of this species. Inverness County: wet meadow, Northeast Margaree, SSSB 4032; wet river edge, Margaree River near Margaree Harbour, SECS 979; wet places, Terre Noire, STWS 7370; wet places, St. Joseph du Moine SSSB 4028; swamp, Cheticamp, SCBSB 3639; occasional in marsh near mouth of Grand Anse Brook, Pleasant Bay, SSSB 4244.

DRABA PYCNOSPERMA Fern. and Knowlt. Victoria County: locally abundant and diseased, dry cliff ledges, Lockhart Brook, Salmon River, STWS 6376. This collection is a first record for the province.

DRABA ARABISANS Michx. Collected once previously in the province from Cape Blomidon, Kings County (Roland, 1947), the following collections show this species to be rather characteristic of cliff ledges and talus slopes in northern Cape Breton. Victoria County: locally abundant on dry ledges and talus, Lockhart Brook, Salmon River, STWS 6373; abundant, cliff ledges and talus, Indian Brook, SSTWS 8144; abundant in cliff crevices, Brunt Mountain, Gray Glen, STWS 6438.

ARABIS HIRSUTA (L.) Scop., var. *PYCNOCARPA* (M. Hopkins) Rollins. Victoria County: dry cliff crevices and talus slopes, Indian Brook, STWS 6618, SSTWS 8124, and JSE 52.483. These first collections extend the known range of this species from New Brunswick and New England.

ARABIS DRUMMONDI Gray. Reported by Roland (1947) as "scattered in northern Cape Breton from Big Intervale Margaree to Cape North," the following represent new stations in Victoria County: dry cliffs and talus, Lockhart Brook, Salmon River, SSTWS 7894; rare on dry cliff and talus, Indian Brook, SSTWS 8118; abundant at shaded cliff base, Burnt Mountain, Gray Glen, STWS 6446.

POTENTILLA HIPPIANA Lehm. Kings County: rare, in field, Marchants Farm, Brooklyn Corner, W. B. Schofield, July 6, 1948. A single crown root was seen representing a casual adventive from the prairies.

GEUM PECKII Pursh. Fernald's (1950) note of the occurrence of this plant in Nova Scotia is based upon the following collection. Digby County: abundant and scattered over an area of several acres, bog between Westport and Big Cove, Brier Island, Roland, Smith *et al.* 95 and 321. As noted by Fernald, this station represents an extension of range from the White Mountains of New Hampshire.

DESMODIUM GLUTINOSUM (Muhl.) Wood. Hants County: on gypsum bluff among *Rhus radicans*, Halfway River, JSE 53.294. This collection

is a second station for the province although only twelve miles from the first.

IMPATIENS PARVIFLORA DC. Kings County: one plant in barnyard, Wolfville JSE 53.208, probably introduced in plant collections from Prince Edward Island.

IMPATIENS GLANDULIFERA Royle. Omitted from Roland's Flora but listed by Fernald for Nova Scotia, the following collections were made from well established stations. Pictou County: common in vacant lots, New Glasgow, A. E. Roland 2612; Digby County: common as weed in dooryard, Westport, Brier Island, W. B. Schofield, 1664; Cape Breton County: growing with *I. capensis* in swamp, North Sydney, SSSB 5404.

EPILOBIUM STRICTUM Muhl. Cumberland County: pond edge, Amherst Point, JSE 52.911. Reported by Erskine (1951) from Antigonish County and Kings County, this collection indicates its presence in the north-central part of the province.

EPILOBIUM NESOPHILUM Fern. Inverness County: bog, head of South Blair River, SCBSB 3800; Victoria County: occasional in swamp, Bay St. Lawrence, SSSB 4505; Cape Breton County: rare in bog, Northwest Cove, Scatari Island, SSSB 5345. New to the flora of the province, consistent with its Gulf of St. Lawrence distribution (Newfoundland, Magdalens, and var. *sabulonense* on Sable Island).

EPILOBIUM HORNEMANNI Reichenb. Not listed in the provincial flora by Roland (1947) but mentioned by Fernald (1948 and 1950) as occurring in Cape Breton, this plant is now found to be characteristic of the banks of cold brooks in the northern part of that island. Inverness County: abundant, banks of cold brooks, Cheticamp River, SSTWS 7803; abundant, wet places along river bank, Three Brooks Pool, Northeast Margaree River, STWS 6318; abundant, shaded brook bank, east side of Big Intervale, Margaree, STWS 6285; occasional in damp places, birch-fir forest at an elevation of 1200 feet, Grand Anse Brook, SSSB 4222; Victoria County: abundant, edge of brook eight miles from mouth of Salmon River, STWS 6341; occasional, brook banks, Lockhart Brook, Salmon River, STWS 6363.

OENOTHERA GRANDIFLORA Ait. Digby County: an escape from cultivation established for one hundred yards along main road at Plympton, JSE 53.216.

OENOTHERA CRUCIATA Nutt. Previously known in the province from the slopes of sand dunes on Sable Island, this collection is the first for the mainland. Lunenburg County: Wentzell's Lake, JSE 52.1065.

PHYLLODOCE CAERULEA (L.) Bab. The discovery of this northern and montane plant in Cape Breton extends its range from Newfoundland, Quebec and Maine. Victoria County: locally abundant on steep north facing cliff slope, Lockhart Brook, Salmon River, JSE 52.513.

VACCINIUM ULIGINOSUM L., var. *ALPINUM* Bigel. The distribution and habitat of this arctic-alpine blueberry in the province is not well known. The following collections are of interest. Victoria County: bare gravelly slope of Burnt Mountain, Gray Glen, STWS 6439; a single

patch on sand dune, South Pond, Aspy Bay, STWS 6463; occasional on high exposure barren, Lockhart Brook, Salmon River, STWS 6350; forming mats on exposure barren, elevation of 1500 feet, Ingonish Barrens, SSSB 4622; on exposed rocks, exposure barren, seven miles west of Neil's Harbour, SCBSB 3809; local on sand beach of salt pond, Neil's Harbour, SCBSB 3496; on drier part of bog above Gray Glen Brook, SSSB 4415; Inverness County: in large clumps, old pasture, South Cape Mabou, STWS 7003; Cape Breton County: on rock outcrop near center of Scatari Island, SSTWS 8577; rare with *Empetrum nigrum* at coast, Scatari Island, SSSB 5276 and JSE 51.1136.

VACCINIUM OVALIFOLIUM Sm. Reported once previously for the province (Smith and Schofield, 1952) when it was found as a single colony, the following collection was made from a station covering several acres. Victoria County: shrub under open forest, Lockhart Brook, Salmon River, STWS 6386.

DIAPENSIA LAPPONICA L. Another range gap is closed by the discovery of this arctic-montane plant in Cape Breton. Victoria County: frequent in clumps on projecting shoulders and in crevices of steep north facing cliff slope, Lockhart Brook, Salmon River, JSE 52.319 and SSTWS 7919.

SCUTELLARIA CHURCHILLIANA Fern. Lunenburg County: scattered on lake shore, Wentzell's Lake, JSE 52.1059; abundant on lake shore, Lewis Lake, JSE 53.408.

STACHYS ARVENSIS L. An adventive not listed by Roland (1947). Halifax County: gardens and roadsides, Halifax, J. Fletcher, September 10, 1904 (DAO); Bedford Basin, Halifax, J. Fletcher, September 10, 1904 (DAO); weedy garden, Halifax, W. G. Dore and E. Gorham, 45.979; weed in garden of Dalhousie University Medical School, Halifax, J. S. Erskine, August 2, 1949; Lunenburg County: Nauss' Swamp, Chester, M. N. Zinck 480 (DAO); Hants County: abundant weed in cultivated field, Windsor, J. S. Erskine, October 5, 1945; Kings County: edge of lawn, Main Street, Kentville, J. S. Erskine, September 13, 1948.

LINDERNIA DUBIA (L.) Pennell. First collected by Fernald at Sheffield Mills, Kings County, the following collection is a second station for the province. Lunenburg County: abundant on bottom of drained mill pond, Maitland Pond, JSE 52.1109.

VERONICA TENELLA All. (= *V. serpyllifolia* L., var. *borealis* Laestad.). New to the province, this plant has been found to be present in its habitat on many of the cold northern brooks. The isolated populations in the different ravines seem to differ somewhat in flower color and in general appearance. Victoria County: abundant, wet mossy brook banks, eight miles from mouth of Salmon River, STWS 6338; common along Gray Glen Brook, SSSB 4461; Inverness County: occasional on gravelly river bank, South Blair River, SCBSB 3793; abundant on wet cliff face, Big Intervale, Margaree, STWS 6251.

VERONICA PEREGRINA L. Halifax County: edge of bare slate, Martello Tower, Halifax, J. S. Erskine, July 31, 1948. New to the flora, a weedy species native to North America and well known east to Quebec.

RHINANTHUS CRISTA-GALLI L. The typical variety of this plant is very rare in Nova Scotia (Roland, 1947). The following collections, all from the more exposed coastal areas, have been made in recent years. Digby County: old hay field near North Light, Brier Island, Roland, Smith *et al.* 500; Inverness County: common in pasture at shore, Cape St. Lawrence, SCBSB 3512; Cape Breton County: rare in field at North-west Cove, Scatari Island, SSSB 5363; abundant on exposed areas behind beach, Eastern Harbour, Scatari Island, SSTWS 8525.

GALIUM LABRADORICUM Wieg. Known from the neighbouring provinces and from the New England States, a range gap is filled by the discovery of this plant in Victoria County: abundant in wet meadow, Bay St. Lawrence, SSSB 4508.

CAMPANULA APARINOIDES Pursh. Hants County: abundant along river beaches and in meadow, Kennetcook River near Mosherville, JSE 53.356; Pictou County: abundant in meadow, Marshy Hope, SSTWS 8824.

EUPATORIUM RUGOSUM Houtt. Cumberland County: frequent along brook near outlet to the sea, Mill Brook west of West Advocate, JSE 52.897. A new record for the province and an extension of range from New Brunswick.

ASTER PILOSUS Willd., var. *DEMOTUS* Blake. Hants County: well established and scattered over several acres, west of Wentworth. A new record for the province representing an extension of range from central Maine.

ANTENNARIA PARLINII Fern. Not of common occurrence in the province, the following records may be added to those already published. Hants County: on gypsum cliffs, Halfway River, JSE 53.296; on dry bluffs, Kennetcook River, JSE 53.364; Kings County: open wooded bluff above Gaspereau River at Melanson, D. S. Erskine 912. In the case of the first two collections, all plants were sterile.

GNAPHALIUM SYLVATICUM L. Rather common eastward in the province, this plant has not previously been reported from the western counties. Queens County: rare on roadside near Devonshire, SSTWS 10315.

ANTHEMIS TINCTORIA L. Colchester County: common escape along railway track, Truro, SSSB 4804; Hants County: roadside, "probably a garden escape," Fish Hatcheries, Lebreau's Creek, Martock, H. T. Bell, A. Gorham, J. Bailly and A. Marshall 50.138; Halifax County: edge of ballast heap, Steele's Pond, Point Pleasant Park, Halifax, J. S. Erskine, July 26, 1949. New to the province, this escape is becoming well established in the central part of the province.

SENECIO SQUALIDUS L. Halifax County: ballast heap, Steele's Pond, Point Pleasant Park, Halifax, J. S. Erskine, July 1949. Adventive from Europe, this appears to be a first record for Canada.

LAPSANA COMMUNIS L. Inverness County: common in old orchards and gardens, Hillsborough, SECS 1206; Victoria County: edge of brook beach, west of Warren Lake, SCBSB 3451. A persistent garden weed not previously reported from Cape Breton Island.

HYPOCHAERIS RADICATA L. Victoria County: meadows, Aspy Bay, M. S. Brown, July 15, 1946. This collection is the first for this weedy species in Cape Breton.

PRENANTHES × *MAINENSIS* Gray. Digby County: sea cliff, Sandy Cove, JSE 52.1149. R. Erskine had collected *P. racemosa* on these sea cliffs in 1949, but a return visit yielded only one plant of this species and one plant which appears to be a hybrid between this and *P. trifoliolata*.

Material substantiating the majority of these records has been deposited at the Acadia University Herbarium and the Herbarium of the Nova Scotia Museum of Science.—PERRY BIOLOGICAL LABORATORIES, ACADIA UNIVERSITY, WOLFVILLE, NOVA SCOTIA AND NOVA SCOTIA MUSEUM OF SCIENCE, HALIFAX, NOVA SCOTIA.

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NUTTALL IN 1815

JEANNETTE E. GRAUSTEIN¹

THE taxonomist who works with Nuttall's specimens gets only vague help from the labels toward determining their origin; a date of any sort is most rare, and stations are indicated in prodigious areas like "Shores of Lake Erie," "Col. R." and "Rocky Mts." It is incumbent on the student to be versed in the many journeys of this pioneer botanist in order to spot the approximate time and location of a collection. Hence, it is fortunate that accounts of Nuttall's most far-reaching expeditions were published either by Nuttall himself or by some companion of the journey—the trips to the Upper Missouri (1810–11), along the Arkansas (1818–20), by the Oregon Trail to the mouth of the Columbia (1834–36), even the rounding of Cape Horn in the depth of the southern winter with its glimpse of Staten Land, tantalizing to Nuttall but barren and repellant to the sailors. However it is quite otherwise in the case of his shorter collecting excursions of less than a year's duration made east of the Mississippi; of these no contemporary descriptions were published and the obituaries deal with them in airy generalities.

The bulk of Nuttall's collecting in the east was done prior to the publication of *Genera of North American Plants, and a Catalog of the Species to the Year 1817* which appeared in 1818, ten years after the author's first arrival in America. Since he was in the eastern United States for only half of the decade the task of mapping the forays involved is narrowly circumscribed, but no guide to them was compiled for more than a hundred years after the specimens were harvested. We are indebted to Pennell's 1936 biography for the first serious attempt to establish the times and routes of the major eastern tours.² This was done successfully for most of the period under discussion by plotting the places and dates mentioned in Nuttall's numerous publications, with the invaluable aid of a few key letters of the botanist which had come to light.

Pennell's chronicle indicates no long botanical excursions

¹ JEANNETTE E. GRAUSTEIN, "Nuttall's Travels into the Old Northwest," *Chronica Botanica* XIV (1950/51), 1–88.

² Francis W. Pennell, "Travels and Scientific Collections of Thomas Nuttall," *Bartonia* XVIII (1936), 1–51.

during Nuttall's first year in America. In 1809 there was a journey in June to Delaware and a second in late summer and autumn to Niagara Falls. The famous trip which culminated in the ascent of the Missouri occupied most of 1810 and 1811, and the next three years were spent in England with a return made to America at some time in the fourth year, 1815. Pennell's account for 1815 is pure speculation except for the documented visit which Nuttall paid to William Baldwin in Savannah in the "fall." On the other hand his recording of Nuttall's extensive 1816-17 travels through western Pennsylvania, down the Ohio, through Kentucky, and across the southern Appalachians is well authenticated. The rest of 1817 and early 1818 was spent in Philadelphia compiling the *Genera*.

Fortunately the record for 1815 can now be filled in from Nuttall's own account found in a letter which he wrote on January 26, 1816, from Wilmington, North Carolina, to Sir Aylmer Bourke Lambert, wherein he gave an animated narrative of his experiences during the previous nine months.³ This letter [the text is given below] reached a haven at the Herbarium of Kew Gardens many decades ago.

Incidentally the letter also solves the mystery of whether Nuttall ever made a report in person to Dr. Benjamin Smith Barton, the promoter of his expedition to the West. The answer to this question must be an "Everlasting No." since Barton had left Philadelphia for the continent of Europe in April, 1815, whereas Nuttall's letter reveals that he did not reach that port until mid-July; and Barton came back to America only shortly before his death at the end of the year while Nuttall was in the South. In this connection it should be recalled that Nuttall, returning down the Missouri River to New Orleans in the autumn of 1811, instead of taking his booty to Barton in Philadelphia had shipped seeds and dried specimens to him and embarked for England.

Whether sailing to his homeland was a free decision or one forced by rising hostilities is still not clear, but once in England Nuttall was obliged to remain there until the peace was signed at the close of 1814. Then he seems to have started promptly

³ "Lambert's Correspondence," Letter No. 96. MS, Royal Botanical Gardens, Kew. The writer is grateful to the Keeper of the Herbarium, for the opportunity of consulting the manuscript collections preserved there.

to settle his various affairs for a second emigration to America for his letter informs us that he took passage in the spring of 1815.

Wilmington [North Carolina]

Jan'y 26th 1816

A. B. Lambert, Esqr—

Dear Sir,

A detail of all my journeys, my adventures, and Botanical discoveries, is much more than I can promise you in this sheet, however happy I might be to indulge my vanity and perhaps tire your patience. If they shall be hereafter deemed worthy by my friends I shall not hesitate to offer my journals to the public, notwithstanding their imperfections.

It was on the 8th of last May that I left Gravesend again to traverse the Atlantic. I had scarcely proceeded to see [sic] when I discovered that myself and about 30 other passengers with a numerous crew of liberated prisoners, had committed our propertys and persons to the conveyance of a wreck and the guidance of a knave. I shall not trouble you with a detail of the villanies and negligence of a renegado who had even fought under the banners of French anarchy and enlisted in the sacrilegious mob whose only aim appeared to be to annihilate the last bonds of human society. By better Fortune than we had any reason to expect, after a tedious passage of *nine* weeks in a vessel every moment on the point of foundering or shipwreck we arrived at the port of Philadelphia about the middle of July. The season was extremely sultry, but my health remained unimpaired. Commercial concerns of trifling importance held me in this place untill the close of August. I now proceeded by Lancaster, York, Hanover and Fredericktown in Maryland to Harper's-Ferry in Virginia the stupendous scene so elegantly described by the ex-president Jefferson in his Notes on Virginia where the rivers Shenandoah and Potomac uniting, appear to burst their way thro' the Blue Ridge, a chain of the Alleghany Mountains, a landscape of horrible grandeur and wild magnificence, of mingled rocks, roaring rivers, and gloomy forests, beyond all the powers of the pencil to imitate.

From the romantic and fertile vale of the Blue Ridge after an excursion of about a month, I proceeded down the Potomac, occasionally lined by the magnificent *Quercus macrocarpon*, *Robinia Pseud-acacia*, and *Porcelia triloba*, to the port of Alexandria, and on the way I had a sight of Washington in its ignominious ruins, the deserted palace of the president and the magnificent wreck of the imaginary Capitol!

On the same day that we left Alexandria, the breeze conducted us past the rural seat of the immortal Washington,—the sacred groves of Mount Vernon, the peacefull but forsaken residence of the Father of America!

In two days more we entered the tepid gulph of Florida and witnessed no less than 6 waterspouts in succession accompanied by streams of rain and thunder. in the midst of winter we have experienced the mildness of a perennial spring. In ten days we arrived at the port of Savannah in Georgia, a town built in the West India style upon a high bank of moveable sand and surrounded by deep and undrainable swamps, a situation so unhealthy as to be justly dreaded by Europeans who but seldom escape either death or disease. Here I was so fortunate as to meet in Dr. Baldwin of the United States navy, a botanist better acquainted with the plants of America than any other person I have yet met with. For more than a week together we were engaged in looking over his herbarium replete with new plants, collected in East and

West Florida near the sea-coast. it was here I first became acquainted with the interesting *Epidendrum Magnoliae*, a plant wh. Doctor B. described as common upon various trees near the town of St. Mary's, in Florida. Some days after this admiring the magnificence and extraordinary elevation of a fine *Magnolia grandiflora* a mile from Savannah I thought I beheld a parasitic plant embracing its lofty branches. I now instantly examined all the *Magnolias* round me and found that I had discovered the *Epidendrum* by this time I doubt not but you have seen this plant of which I sent a considerable quantity to Anderson and desired him to send you a plant. Near Savannah grows a singular thicket of the *Pinckneya*, the *Tripterella* * *coerulea*, *Caladium speciosum*, *Dichroma leucocephala*, *Lilium Carolinense*, *Liatris speciosa*, *L. odoratissima*, *L. paniculata*, *L. puberula*, *L. spicata*, *L. pedunculata* (I am now acquainted with 14 species of this genus) *Kalmia hirsuta*, *Xyris* * *gelatinosa*, *Gerardia* * *linifolia* (this new species I have sent to Anderson under the name of *G. crassiuscula* but there can be no better name than that of *G. LINIFOLIA*, it is a perennial purple flowered species,—I first discovered it near Savannah, and I have now occasionally met with it to Wilmington (North Carolina).

After about a month's residence in Savannah I continued my journey to Augusta in this state. I heard of Abbot but had not the pleasure of seeing him. In my way thro' these forests of perennial verdure almost exclusively filled with the *Pinus australis*, in a soil of almost pure sand, I was occasionally gratified by repeated discoveries of new and rare plants. In Doctor Baldwin's herbarium I observed a very singular new genus of syngenesious plants, wh. he found on the banks of the Altamahah, the river ascended by Bartram, accompanied by a new species of *Hymenopappus* with entire lanceolate leaves large white flowers, and furnished with a long acuminate pappus of 5 divisions, the new genus I have called *Baldwynia cellulosa*, this plant possesses an elevated receptacle perforated by pentagonal cells like honey-comb so deep as completely to envelope the seeds from sight which are furnished with a chaffy pappus; about 20 mls. from Savannah on my way to Augusta I found a second species of this interesting genus accompanied by the . . . *Chaptalia* in . . . and a beautiful new purple flowered species of *Coreopsis!* not [at] all allied to the D'Halsa of Mexico. Near here I met with the curious species of *Nymphaea* described by Walter as the *N. longip* . . . [Letter torn] Its leaves a good deal like those of *N. odorata* round large and floating on the surface of the water produces often petioles of a fathom in length! and YELLOW flowers. Wherever the sterile platform of sand was diversified by a gravelly hill the southern oaks uniformly made their appearance such as the *Quercus Catesbei*, *Q. nigra*, *Q. triloba*, *Q. cinerea*, *Q. obtusiloba*, and *Q. coccinea* but the most prevalent of all the species is the *Q. Catesbei* wh. appears often after the prevalence of the pines to usurp the place of the long leaved Pine. 32 mls. West of Savannah I observed abundance of the *Mylocarium* the *Brunnichia* and the *Gleditsia* [sic] *monosperma*. 42 mls. from Savannah on the road I found the *Laurus diospyros*, and the *Chrysobalanus* * *oblongifolius* of Muhlenberg's catalogue wh. produces a large edible plumb of a clear red and contains a seed enveloped by a soft quinque-partite shell, it is a shrub of scarcely one foot in height sending out innumerable surculi, the stem is never branched and the flowering panicle terminal. The leaves are lucid, coriaceous cuneate-oblong, and generally evergreen I next found a new and elegant suffruticose species of *Hedeoma*, the *Petalostemon carneum*, *Raynia perfoliata* a new *Cupressus?* The *Sparganophorus verticillatus*, a new *Rudbeckia*, a new *Polygala* & *Ceanothus microphyllus* two or 3 species of *Podalyria*, *Psoralea mollis*, *Galaridia*

bicolor, a grassy leaved *Helonias*, *Amsonia angustifolia*, a new *Aristida* with remarkably long awns. After spending a few days in Augusta in the agreeable company of Dr. T. Wray I crossed the Savannah and have now crossed the center of South Carolina to this place. I cannot here detail to you in any way my discoveries in So. Carolina. I will just mention some of the principal—12 mls. from Augusta I found to my great gratification the singularly beautiful shrub *Ceratiola Ericoides* it looks exactly like a Cape heath, grows 12 feet high and was now filled with aggregate clusters of greenish yellow berries, and I have got abundance of its seeds. here I also found the *Iris tripetala* of Walter and a new *Liatris* perfectly smooth and branched from the base of the stem. Near Wilmington I have found the *Phlea tenuifolia* of Michaux and have sent roots to Anderson and ordered him to send you one.

If no extraordinary disappointment takes place with me I hope to ascend Red River of the Mississippi and examine the adjoining province of Mexico in wh. no doubt I shall meet a rich harvest of Botanical treasure.

Yours by every occasion

Thos Nuttall

Inclosed you will observe the *Tripterella coerulea*, is it not the *Burmennia biflora* of Linnaeus? I should be glad to know. Direct me at the Philadelphia Post-Office.

A NOTE ON CERATOPHYLLUM DEMERSUM AND C. ECHINATUM IN WORCESTER COUNTY, MASSACHUSETTS.—Until 1953, only one sheet of *Ceratophyllum* had been collected in fruit from Worcester County, Massachusetts. An ardent plant collector of herbarium specimens, Rev. Frank C. Seymour, has remembered that "I have searched for the fruit of *Ceratophyllum* all my life, but never found it."¹ The late Dr. Fernald said ". . . We strained our backs, legs and eyes, bending over and carefully fingering, underwater, thousands of plumes of the *Ceratophyllum* in a vain search for fruit."²

However, during the summer of 1953, while studying and collecting aquatic plants of Worcester County, numerous mature fruiting specimens of both *Ceratophyllum demersum* L. and *C. echinatum* Gray were found by the writer. According to Fernald,³ *C. demersum* ". . . needs careful collecting and study," and *C. echinatum* is ". . . less often collected than No. 1." [the previous species]

One specimen of *C. demersum* was collected in fruit from Bartlett Pond, Northboro, Mass., on August 6, 1953. Speci-

¹ SEYMOUR, F. C., Personal communication.

² FERNALD, M. L., Another Century of Additions to the Flora of Virginia, RHODORA 43, p. 508.

³ FERNALD, M. L., Gray's Manual of Botany, American Book Co., p. 636, 1950.

mens of *C. echinatum* were collected in fruit from the following stations:

Cider Mill Pond, Grafton, Mass., July 16, 1953.

Perry Pond, North Brookfield, Mass., August 11, 1953.

Muddy Pond, Oakham, Mass., July 17, 1953.

Cemetery Pond, Warren, Mass., September 18, 1953.

These specimens are deposited in the Herbarium of the Hadwen Botanical Club at the Biology Department of Clark University, Worcester, Massachusetts.

After close study of the fruiting material and reference to Dr. Fassett's paper on *Ceratophyllum*,⁴ the sterile specimens in the Hadwen Herbarium have now been identified. It appears at this time that *C. echinatum* is more common in Worcester County than *C. demersum*. The former species has been found in 16 of the 60 towns, while the latter has been found in only 3 of the 60 towns in the county.

The fruiting specimens were found only where the plants were "rooted"⁵ in the muck substrate and completely submerged. No fruiting specimens were found floating in the ponds. Usually the fruiting specimens were found growing in extensive colonies in water ranging from 14 to 30 or more inches deep. At these depths, at least some of the fruits were definitely visible from the collecting boat. By passing one's hand over the growth to move it slightly, many more fruits were brought clearly into view. Finding the fruiting specimens of *Ceratophyllum* is more readily accomplished if the plants remain completely submerged than if they are removed from the water.—PHILIP G. MEISSNER, CLARK UNIVERSITY, WORCESTER, MASSACHUSETTS.

A METHOD OF MOUNTING PRESSED FLOWERS FOR STUDY AND PRESERVATION.—Some years ago, while I was working on the taxonomy of *Lupinus*, Professor Carl Epling of the University of California at Los Angeles, introduced me to a technique of boiling a flower in an electric baby bottle warmer, which eliminates the hazard of fire in an herbarium that might originate

⁴ FASSETT, N. C., North American *Ceratophyllum*, Comunicaciones del Instituto de Investigaciones Cientificas, No. 2, March 1953, Universitas del Salvador, Central America.

⁵ According to Muenscher in *Aquatic Plants of the United States*, "The roots are absent even in the seedling. The radicle does not enlarge or elongate during seed germination." p. 228-230.

from the use of an alcohol lamp. The flower was then dissected and the parts mounted on a glass microscope slide in a medium of glycerin and mucilage (Lepage's, or any other standard mucilage). The proportions of glycerin and mucilage vary with the geographic region, depending on the relative humidity, and must be worked out for each location. Start with about 1 part of glycerin to 10 parts of mucilage. Test a few drops on a slide allowing the medium to dry thoroughly. The glycerin-mucilage medium should dry to a smooth, hard texture. Too much glycerin will cause the medium to be sticky and too much mucilage will cause the medium to crack and chip loose from the slide.

The addition of hot water to the medium during the dissection of the flower makes the dissection much easier. The slides may be dried and kept as is, indefinitely, as long as they are not moved from one region of the country to another. Transporting the slides from a humid region to a dry region will require the addition of water and glycerin to prevent chipping.

The procedure is valuable from the standpoint of obtaining accurate measurements of the size and shape of the critical characters of the taxa. A set of 25 slides, or more, may be readily prepared and is desirable for the study of the amount of variation within a taxon. This method is also a means of preserving, in a useable state, the limited number of parts remaining on very old type specimens. In addition, the glycerin acts as a clearing agent, often making it possible to count the number of ovules in an ovary, in a whole mount.

With the above technique the slides cannot be attached to the herbarium sheets without the danger of adhering to the paper and destroying the dissected specimen. A coating of plastic remedies this difficulty. The following over-all procedure is one that I have adopted, using the mounting plastic described by Archer.¹ In addition, a short period of staining with Sudan IV is desirable, for those floral structures with ciliation or structures which tend to become translucent on boiling.

1). Boil the flowers, leaving them to stand in the hot water long enough to return to their original size and shape. A detergent may be used; however, it is not desirable to distort the walls of the cells.

¹ W. A. Archer. New Plastic Aid in Mounting Herbarium Specimens. *RHODORA* 52: 298. 1950.

- 2). Dissect the flower to show the parts in their most advantageous position.
- 3). Stain those floral parts with ciliation or those that are translucent, for a short time, in Sudan IV and wash thoroughly.
- 4). Place one flower on the slide as a whole mount, in a position that best shows the relation of the parts.
- 5). Allow the glycerin-mucilage medium to dry overnight or in a drying oven.
- 6). Put several drops of toluene on the slide and then coat the slide with the plastic used in mounting herbarium specimens.
- 7). Bubbles in the plastic may be removed by placing a drop of toluene above each.
- 8). Fragments of leaves may be pressed into the wet plastic with top and bottom surfaces free. The plastic may render the hairs difficult to see, without staining, if the leaves are completely imbedded.

If the plastic should crack in a thin area it can be readily repaired by a drop of toluene and the addition of more plastic.

Various stains have been tried, over a period of years, but most either darken the flower parts too much or they are water soluble and diffuse out into the medium of glycerin and mucilage. The extra glycerin, mucilage and stain can be washed off with hot water and the slides redried and then coated with plastic. However, thus far, Sudan IV has been found to be the most satisfactory stain, since it stains only the fats and waxes, such the material in the cuticle. The color is delicate and does not mask the ovules, rendered visible by the glycerin, but is still sufficient to make the ciliation readily visible under a microscope.

—DAVID B. DUNN, VISITING LECTURER, BOTANY DEPARTMENT, UNIVERSITY OF MINNESOTA, MINNEAPOLIS.

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